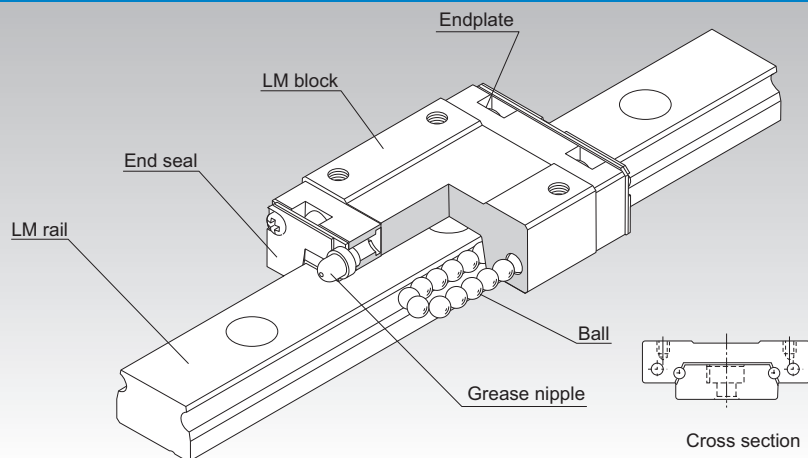


RSR

LM Guide Miniature Types Model RSR



Point of Selection	A1-10
Point of Design	A1-450
Options	A1-473
Model No.	A1-537
Precautions on Use	A1-542
Accessories for Lubrication	A24-1
Mounting Procedure and Maintenance	B1-89
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Rated Loads in All Directions	A1-58
Equivalent factor in each direction	A1-60
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Permissible Error of the Mounting Surface	A1-467
Flatness of the Mounting Surface	A1-468
Dimensions of Each Model with an Option Attached	A1-484

Structure and Features

With models RSR and RSR-W, balls roll in two rows of raceways precision-ground on an LM rail and an LM block, and endplates incorporated in the LM block allow the balls to circulate. Since balls circulate in a compact structure, the LM Block is able to provide infinite straight motion and thus infinite stroke.

The LM block is designed to have a shape with high rigidity in a limited space, and in combination with large-diameter balls, demonstrates high rigidity in all directions.

[Ultra Compact]

The absence of cage displacement, a problem that cross-roller guides and types of ball slides with finite stroke tend to cause, make these models highly reliable LM systems.

[Capable of Receiving Loads in All Directions]

These models are capable of receiving loads in all directions, and a single-rail guide can adequately operate under a small moment load. Model RSR-W, in particular, has a greater number of effective balls and a broader LM rail to increase its rigidity against a moment. Thus, it achieves a more compact structure and more durable straight motion than a pair of linear bushes in parallel use.

[Stainless Steel Type also Available]

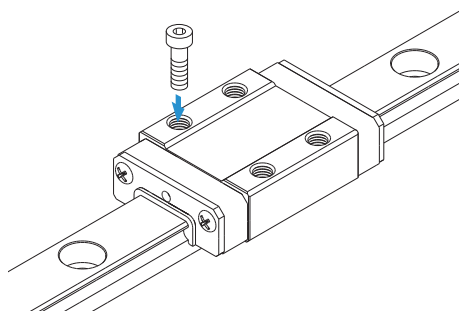
A special type where LM block, LM rail and balls are made of stainless steel is also available.

Types and Features

Models RSR-M/RSR-KM/RSR-VM

Specification Table⇒ **A1-258**

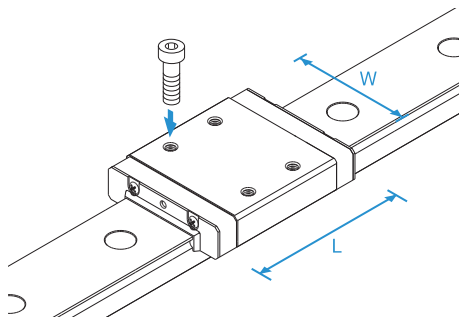
This model is a standard type.



Models RSR-WM/WV/WVM

Specification Table⇒ **A1-260**

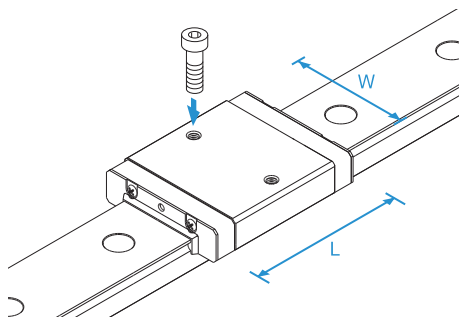
These models have greater overall LM block lengths (L), broader widths (W) and greater rated loads and permissible moments than standard types.



Model RSR-WTM

Specification Table⇒ **A1-260**

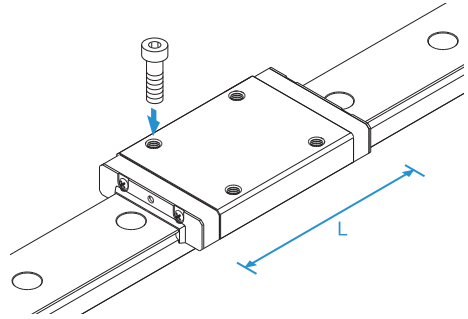
Has position of LM block mounting holes changed compared with RSR-WM.



Model RSR-N

It has a longer overall LM block length (L) and a greater rated load than standard types.

Specification Table⇒ **A1-256**

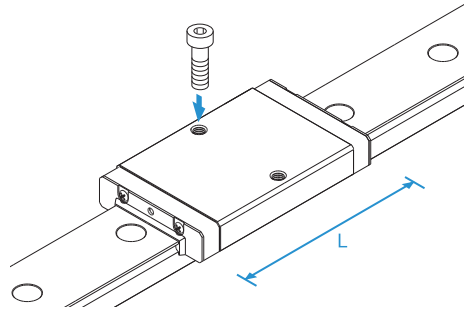


LM Guide

Model RSR-TN

Has position of LM block mounting holes changed compared with RSR-N.

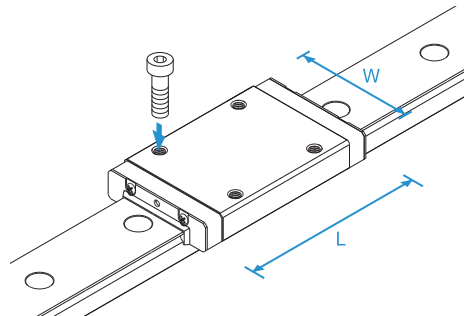
Specification Table⇒ **A1-256**



Models RSR-WN/WTN

It has a longer overall LM block length (L), a greater rated load than standard types. Achieves the greatest load capacity among the miniature type LM Guide models.

Specification Table⇒ **A1-260**



Comparison of Model RSR-W with Other Model Numbers

[Locations where a Pair of Linear Bushes are Used]

- Unlike the linear bushes, model RSR-W can be used in a single-rail configuration and allows space saving.
- Since model RSR-W has more load-bearing balls per row and wider LM block and LM rail, thus to achieve high rigidity against an overhung load.
- Accuracy can be achieved simply by mounting the LM rail using bolts. Therefore, the assembly time can be shortened.

Example of comparing model RSR12W with model LM 10 in use

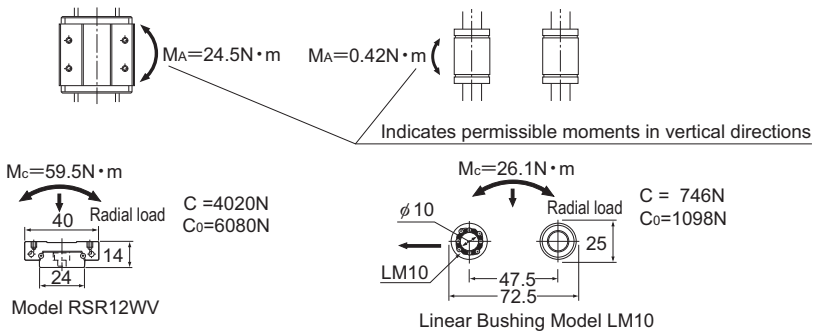


Fig.1

[Locations where a Cross-roller Table is Used]

- Does not show cage displacement even with vertical motion, and capable of performing infinite straight motion.
- Eliminates the need for difficult clearance adjustment and achieves long-term, smooth motion over a long period of time.
- Since the LM block width is large, the model can be used as a miniature table without any modification.

Example of comparing model RSR9WV with model VRM1035 in use

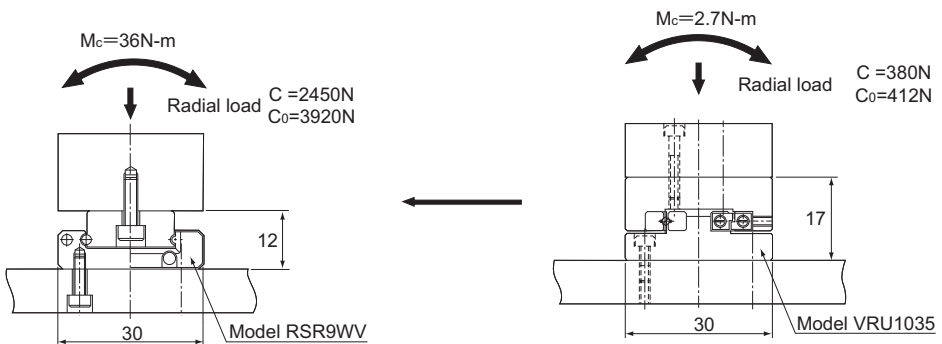


Fig.2

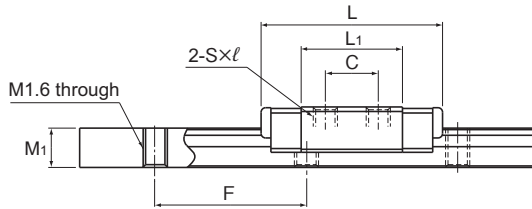
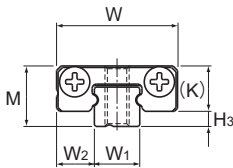
Accuracy of the Mounting Surface

Model RSR uses Gothic arch grooves in the ball raceways. When two rails of RSR are used in parallel, any error in accuracy of the mounting surface may increase rolling resistance and negatively affect the smooth motion of the guide. For specific accuracy of the mounting surface, see [Flatness of the Mounting Surface] on **A1-468**.

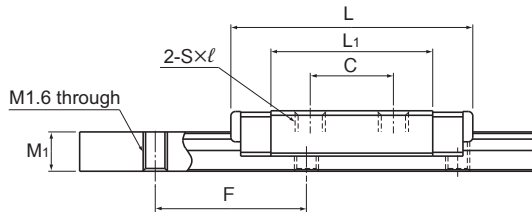
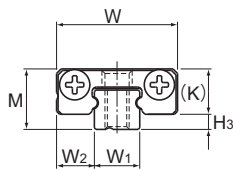
When using this model in locations where it is difficult to obtain satisfactory accuracy of the mounting surface, we recommend using types RSR···A (semi standard) whose ball raceways have circular-arc grooves. (avoid using these types in a single-rail configuration).

For specific accuracy of the mounting surface for types RSR···A, [Flatness of the Mounting Surface] is on **A1-468**.

Models RSR-M, RSR-N and RSR-TN



Model RSR3M



Model RSR3N

Model No.	Outer dimensions			LM block dimensions										H ₃
	Height	Width	Length	B	C	S × l	L ₁	T	K	N	E	Greasing hole d	Grease nipple	
	M	W	L											
RSR 3M RSR 3N	4	8	12 16	—	3.5 5.5	M1.6 × 1.3 M2 × 1.3	6.7 10.7	—	3	—	—	—	—	1
RSR 5M RSR 5N RSR 5TN	6	12	16.9 20.1 20.1	8 — 8	— 7 —	M2 × 1.5 M2.6 × 1.8 M2 × 1.5	8.8 12 12	—	4.5	0.8	—	0.8	—	1.5

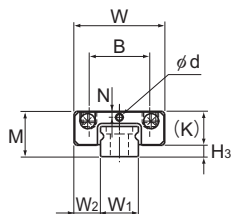
Note) Since stainless steel is used in the LM block, LM rail and balls, these models are highly resistant to corrosion and environment. Models RSR3M and 3N do not have an oil hole. When lubricating them, apply a lubricant directly to the LM rail raceways. No contamination protection seal for RSR3M/3N. To secure the LM rail of models RSR5M and 5N, use cross-recessed head screws for precision equipment (No. 0 pan head screw, class 1) M2.

Model number coding

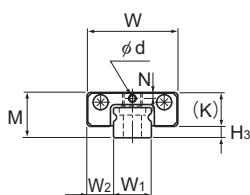
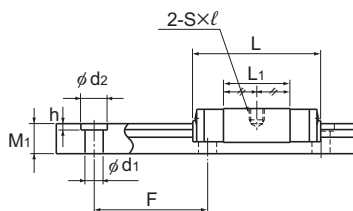
2	RSR5	M	UU	C1	+130L	P	M	-II
No. of LM blocks used on the same rail	Model number		Contamination protection accessory symbol (*1)	Radial clearance symbol (*2) Normal (No symbol) Light preload (C1)	LM rail length (in mm)	Accuracy symbol (*3) Normal grade (No Symbol)/Precision grade (P)	Stainless steel LM rail	Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on **A1-510**. (*2) See **A1-71**. (*3) See **A1-83**. (*4) See **A1-13**.

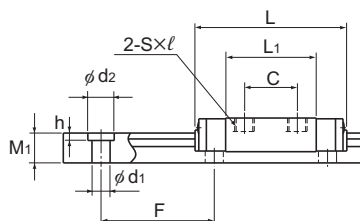
Note) This model number indicates that a single-rail unit constitutes one set. (i.e., required number of sets when 2 rails are used in parallel is 2 at a minimum.)



Models RSR5M/5TN



Model RSR5N



Unit: mm

LM rail dimensions							Basic load rating		Static permissible moment N·m*					Mass	
Width	Height	Pitch	Length*	C	C ₀	M _A	M _B	M _C	LM block		LM rail				
									W ₁	W ₂	M ₁	F	d ₁ × d ₂ × h	Max	kN
3 ⁰ _{-0.02}	2.5	2.6	10	—	200	0.18	0.27	0.293	2.11	0.293	2.11	0.45	0.0011	0.055	
						0.3	0.44	0.726	4.33	0.726	4.33	0.73	0.0016		
5 ⁰ _{-0.02}	3.5	4	15	2.4 × 3.5 × 1	200	0.32	0.59	0.884	6.51	0.884	6.51	1.53	0.003	0.14	
						0.55	0.96	1.84	11.9	1.84	11.9	2.49	0.004		
						0.55	0.96	1.84	11.9	1.84	11.9	2.49	0.004		

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-264**.)

Static permissible moment*: 1 block: static permissible moment value with 1 LM block

Double blocks: static permissible moment value with 2 blocks closely contacting with each other

● Recommended tightening torque when mounting the LM rail/block

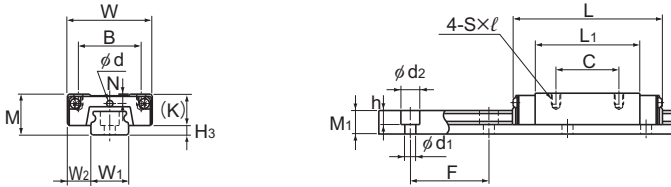
Table1 shows recommended bolt tightening torques when mounting the LM block and LM rail of models RSR3M/3N.

Table1 Recommended Tightening Torques of Mounting Bolts

Model No. of screw	Recommended tightening torque (N·m)
M1.6	0.09
M2	0.19

Note) Applicable to austenite stainless steel hexagonal-socket-head type bolts.

Models RSR-M, RSR-KM, RSR-VM and RSR-N



Models RSR7 to 12N/7M/9KM/12VM

Model No.	Outer dimensions			LM block dimensions										Greasing hole	Grease nipple	H ₃
	Height	Width	Length	B	C	S×ℓ	L ₁	T	K	N	E	d				
	M	W	L	B	C	S×ℓ	L ₁	T	K	N	E	d				
RSR 7M RSR 7N	8	17	23.4 33	12	8 13	M2×2.5	13.4 23	—	6.5	1.7	—	1.2	—	1.5		
RSR 9KM RSR 9N	10	20	30.8 40.8	15	10 16	M3×3	19.8 29.8	—	7.8	2.4	—	1.5	—	2.2		
RSR 12VM RSR 12N	13	27	35 47.7	20	15 20	M3×3.5	20.6 33.3	—	10	3	—	2	—	3		
RSR 15VM RSR 15N	16	32	42.9 60.7	25	20 25	M3×4	25.7 43.5	—	12	3.5	3.6 3.7	—	PB107	4		
RSR 20VM RSR 20N	25	46	66.5 86.3	38	38	M4×6	45.2 65	5.7	17.5	5	6.4	—	A-M6F	7.5		

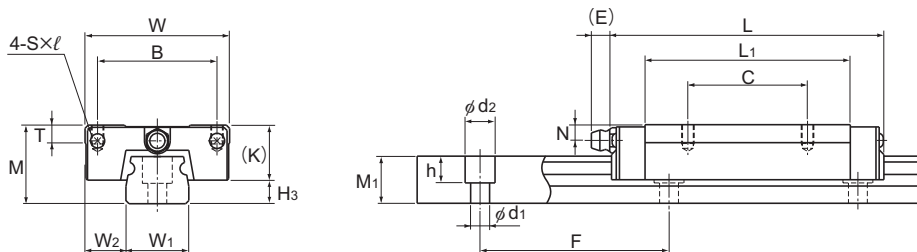
Note) Since stainless steel is used in the LM block, LM rail and balls, these models are highly resistant to corrosion and environment.

Model number coding

2	RSR15V	M	UU	C1	+230L	P	M	-II
No. of LM blocks used on the same rail	Model number	Contamination protection accessory symbol (*1)	LM rail length (in mm)	Radial clearance symbol (*2) Normal (No symbol) Light preload (C1)	Stainless steel LM rail	Accuracy symbol (*3) Normal grade (No Symbol)/High accuracy grade (H) Precision grade (P)	Symbol for No. of rails used on the same plane (*4)	

(*1) See contamination protection accessory on **A1-510**. (*2) See **A1-71**. (*3) See **A1-83**. (*4) See **A1-13**.

Note) This model number indicates that a single-rail unit constitutes one set. (i.e., required number of sets when 2 rails are used in parallel is 2 at a minimum.)



Models RSR15 and 20VM/N

Unit: mm

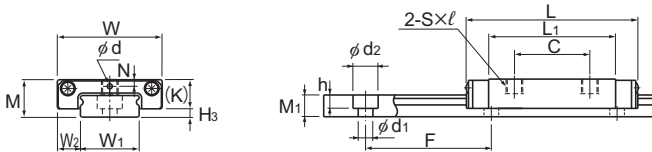
LM rail dimensions						Basic load rating		Static permissible moment N-m*						Mass	
Width	Height	Pitch	Length*	C	C ₀	M _A		M _B		M _C		LM block	LM rail		
						W ₁	W ₂	M ₁	F	d ₁ × d ₂ × h	Max			kN	kN
7 ⁰ _{-0.02}	5	4.7	15	2.4 × 4.2 × 2.3	300	0.88 1.59	1.37 2.5	2.93 8.68	20.8 49.9	2.93 8.68	20.8 49.9	5 9.12	0.013 0.018	0.23	
9 ⁰ _{-0.02}	5.5	5.5	20	3.5 × 6 × 3.3	1000	1.47 2.6	2.25 3.96	7.34 18.4	43.3 97	7.34 18.4	43.3 97	10.4 18.4	0.018 0.027	0.32	
12 ⁰ _{-0.025}	7.5	7.5	25	3.5 × 6 × 4.5	1340	2.65 4.3	4.02 6.65	11.4 28.9	74.9 163	10.1 25.5	67.7 145	19.2 31.8	0.037 0.055	0.58	
15 ⁰ _{-0.025}	8.5	9.5	40	3.5 × 6 × 4.5	1430	4.41 7.16	6.57 10.7	23.7 63.1	149 330	21.1 55.6	135 293	38.8 63	0.069 0.093	0.925	
20 ⁰ _{-0.03}	13	15	60	6 × 9.5 × 8.5	1800	8.82 14.2	12.7 20.6	75.4 171	435 897	66.7 151	389 795	96.6 157	0.245 0.337	1.95	

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-264**.)

Static permissible moment*: 1 block: static permissible moment value with 1 LM block

Double blocks: static permissible moment value with 2 blocks closely contacting with each other

Models RSR-WM(WTM) and RSR-WN(WTN)



Models RSR3 to 7WM/WN

Model No.	Outer dimensions			LM block dimensions											H ₃
	Height M	Width W	Length L	B	C	S×ℓ	L ₁	T	K	N	E	Greasing hole d	Grease nipple		
RSR 3WM RSR 3WN	4.5	12	14.9 19.9	—	4.5 8	M2×1.7	8.5 13.3	—	3.5	0.8	—	0.8	—	1	
RSR 5WM RSR 5WTM RSR 5WN RSR 5WTN	6.5	17	22.1 22.1 28.1 28.1	— 13 — 13	6.5 — 11 —	M3×2.3 M2.5×1.5 M3×2.3 M2.5×1.5	13.7 13.7 19.7 19.7	—	5	1.1	—	0.8	—	1.5	
RSR 7WM RSR 7WTM RSR 7WN RSR 7WTN	9	25	31 31 40.9 40.9	— 19 — 19	12 8 18 17	M4×3.5 M3×3 M4×3.5 M3×3	20.4 20.4 30.3 30.3	—	7	1.6	—	1.2	—	2	

Note) The LM block, rail, and ball material are composed of stainless steel and are corrosion resistant to general environments.
To secure the LM rail of models RSR3WM and 3WN, use cross-recessed head screws for precision equipment (No. 0 pan head screw, class 1) M2.

Model number coding

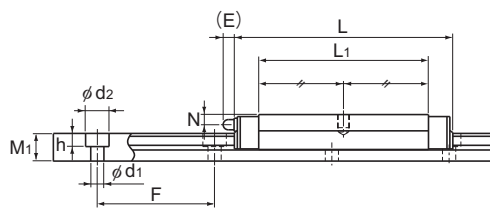
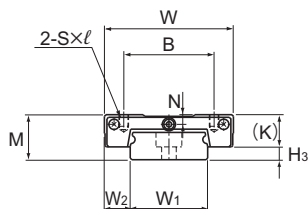
2 **RSR7WM** **UU** **C1** **+130L** **P** **M**

| Model number | Contamination protection accessory symbol (*1) | LM rail length (in mm) | Stainless steel LM rail | Accuracy symbol (*3) |

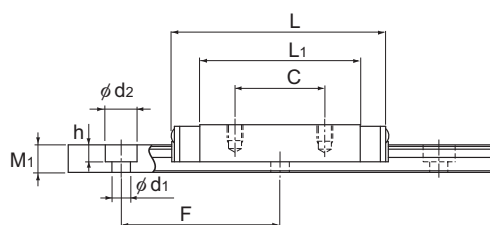
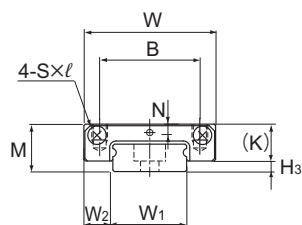
No. of LM blocks used on the same rail | Radial clearance symbol (*2) | Normal grade (No Symbol)/High accuracy grade (H) | Precision grade (P) |

Normal (No symbol) | Light preload (C1) |

(*1) See contamination protection accessory on **A1-510**. (*2) See **A1-71**. (*3) See **A1-83**.



Models RSR5WTM/WTN



Models RSR7WTM/WTN

Unit: mm

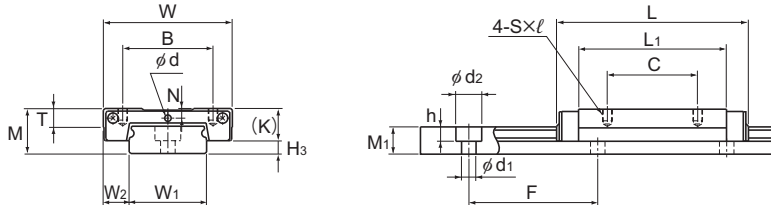
	LM rail dimensions							Basic load rating		Static permissible moment N-m*					Mass	
	Width		W ₃	Height/Pitch		Length*	C	C ₀	M _A		M _B		M _C	LM block	LM rail	
	W ₁	W ₂		M ₁	F				d ₁ × d ₂ × h	1 block	Double blocks	1 block	Double blocks			1 block
	W ₁	W ₂	M ₁	F	d ₁ × d ₂ × h	Max	kN	kN	1 block	Double blocks	1 block	Double blocks	1 block	kg	kg/m	
6	⁰ _{-0.02}	3	—	2.6	15	2.4 × 4 × 1.5	100	0.25	0.47	0.668	4.44	0.668	4.44	1.48	0.002	0.12
								0.39	0.75	1.57	9.06	1.57	9.06	2.36	0.003	
10	⁰ _{-0.025}	3.5	—	4	20	3 × 5.5 × 3	200	0.51	0.96	1.97	13.1	1.97	13.1	4.89	0.007	0.28
								0.51	0.96	1.97	13.1	1.97	13.1	4.89	0.007	
								0.75	1.4	4.06	23.5	4.06	23.5	7.13	0.01	
								0.75	1.4	4.06	23.5	4.06	23.5	7.13	0.01	
14	⁰ _{-0.05}	5.5	—	5.2	30	3.5 × 6 × 3.2	400	1.37	2.16	7.02	40.7	7.02	40.7	15.4	0.021	0.51
								1.37	2.16	7.02	40.7	7.02	40.7	15.4	0.021	
								2.04	3.21	14.7	77.6	14.7	77.6	22.9	0.026	
								2.04	3.21	14.7	77.6	14.7	77.6	22.9	0.026	
								2.04	3.21	14.7	77.6	14.7	77.6	22.9	0.026	

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-264**.)

Static permissible moment*: 1 block: static permissible moment value with 1 LM block

Double blocks: static permissible moment value with 2 blocks closely contacting with each other

Models RSR-WV, RSR-WVM and RSR-WN



Models RSR9, 12WV/WVM/WN

Model No.	Outer dimensions			LM block dimensions											H ₃	
	Height	Width	Length	B	C	S×ℓ	L ₁	T	K	N	E	Greasing hole d	Grease nipple			
	M	W	L	B	C	S×ℓ	L ₁	T	K	N	E	d	Grease nipple	H ₃		
RSR 9WV	12	30	39	21	12	M2.6×3	27	—	7.8	2	—	1.6	—	4.2		
* RSR 9WVM			39	21	12	M2.6×3	27									
* RSR 9WN			50.7	23	24	M3×3	38.7									
RSR 12WV	14	40	44.5	28	15	M3×3.5	30.9	4.5	10	3	—	2	—	4		
* RSR 12WVM			44.5												15	30.9
* RSR 12WN			59.5												28	45.9
* RSR 14WVM	15	50	50	35	18	M4×4.5	34.3	6	11.5	3	4	—	PB107	3.5		
RSR 15WV	16	60	55.5	45	20	M4×4.5	38.9	5.6	12	3.5	3	—	PB107	4		
* RSR 15WVM			55.5												20	38.9
* RSR 15WN			74.5												35	57.9

Note) *The LM block, rail, and ball material are composed of stainless steel and are corrosion resistant to general environments.

Model number coding

2 RSR12WV M UU C1 +310L H M

Model number
No. of LM blocks
used on the same rail

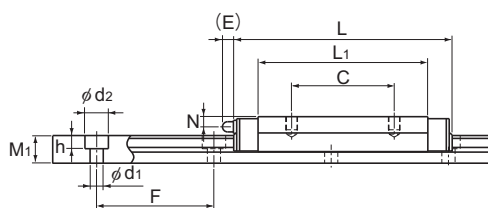
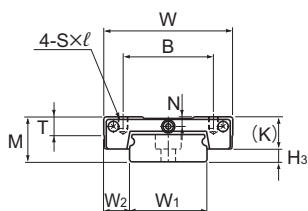
Contamination
protection
accessory
symbol (*1)

Radial clearance symbol (*2)
Normal (No symbol)/Light preload (C1)

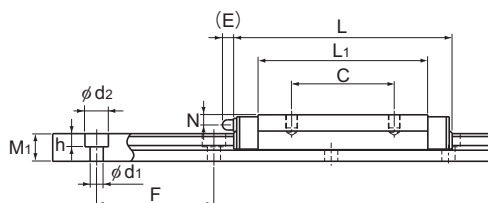
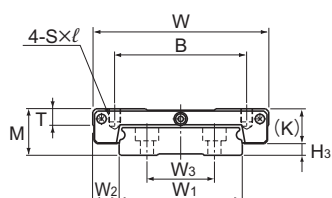
LM rail length
(in mm)

Stainless steel
LM rail
Accuracy symbol (*3)
Normal grade (No Symbol)/High accuracy grade (H)
Precision grade (P)

(*1) See contamination protection accessory on **A1-510**. (*2) See **A1-71**. (*3) See **A1-83**.



Model RSR14WVM



Models RSR15WV/WVM/WW

Unit: mm

LM rail dimensions							Basic load rating		Static permissible moment N·m*					Mass	
Width	W ₂	W ₃	Height	Pitch	Length*	C	C ₀	M _A		M _B		M _C	LM block	LM rail	
								1 block	Double blocks	1 block	Double blocks	1 block			kg
W ₁			M ₁	F	Max	kN	kN	1	Double blocks	1	Double blocks	1			
18 ⁰ _{-0.05}	6	—	7.5	30	3.5×6×4.5	1000	2.45	3.92	16	92.9	16	92.9	36	0.035	1.08
							2.45	3.92	16	92.9	16	92.9	36	0.035	
							3.52	5.37	31	161	31	161	49.4	0.051	
24 ⁰ _{-0.05}	8	—	8.5	40	4.5×8×4.5	1430	4.02	6.08	24.5	138	21.7	123	59.5	0.075	1.5
							4.02	6.08	24.5	138	21.7	123	59.5	0.075	
							5.96	9.21	53.9	274	47.3	242	90.1	0.101	
30 ⁰ _{-0.05}	10	—	9	40	4.5×7.5×5.3	1800	6.01	9.08	43.2	233	38.2	208	110	0.096	2
42 ⁰ _{-0.05}	9	23	9.5	40	4.5×8×4.5	1800	6.66	9.8	50.3	278	44.4	248	168	0.17	3
							6.66	9.8	50.3	278	44.4	248	168	0.17	
							9.91	14.9	110	555	97.3	490	255	0.21	

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-264**.)

Static permissible moment*: 1 block: static permissible moment value with 1 LM block

Double blocks: static permissible moment value with 2 blocks closely contacting with each other

Standard Length and Maximum Length of the LM Rail

Table2 shows the standard and maximum lengths of the RSR model rail.

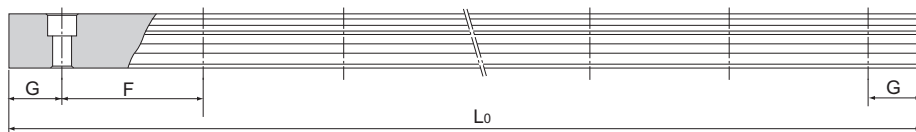


Table2 Standard Length and Maximum Length of the LM Rail for Model RSR/RSR-W

Unit: mm

Model No.	RSR 3	RSR 5	RSR 7	RSR 9	RSR 12	RSR 15	RSR 20	RSR 3W	RSR 5W	RSR 7W	RSR 9W	RSR 12W	RSR 14W	RSR 15W
LM rail standard length (L ₀)	30	40	40	55	70	70	220	40	50	50	50	70	110	110
	40	55	55	75	95	110	280	55	70	80	80	110	150	150
	60	70	70	95	120	150	340	70	90	110	110	150	190	190
	80	100	85	115	145	190	460		110	140	140	190	230	230
	100	130	100	135	170	230	640		130	170	170	230	270	270
			160	130	155	195	270	880	150	200	200	270	310	310
				175	220	310	1000		170	260	260	310	430	430
				195	245	350				290	290	390	550	550
				275	270	390					320	470	670	670
				375	320	430						550	790	790
					370	470								
					470	550								
				570	670									
					870									
Standard pitch F	10	15	15	20	25	40	60	15	20	30	30	40	40	40
G	5	5	5	7.5	10	15	20	5	5	10	10	15	15	15
Max length	200	200	300	1000	1340	1430	1800	100	200	400	1000	1430	1800	1800

Note1) The maximum length varies with accuracy grades. Contact THK for details.

Note2) The LM rail mounting hole of model RSR3 is an M1.6 through hole.

Stopper

In model RSR/RSR-W, the balls fall out if the LM block comes off the LM rail.

For this reason, they are delivered with a stopper fitted to prevent the LM block coming off the rail. If you remove the stopper when using the product, take care to ensure that overrun does not occur.

Table3 Model RSR/RSR-W stopper (C type) specification table

Unit: mm

Model No.	A	B	C
7	11	5	7.7
9	13	6	9.5
12	16	7	12.5
15	19	7	14.5
20	25	7	20.0
7W	18	6	8.2
9W	23	7	11.5
12W	29	7	13.5
14W	33.8	7	13
15W	46	7	14.5

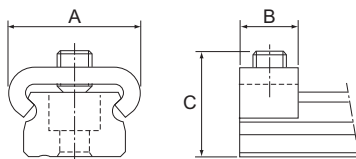


Fig.1 Model RSR/RSR-W stopper (C type)

Note) Models RSR3M/N, 5M/N and 5W use O-rings, while model RSR3W uses silicon tubing.

